

WHAT IS CLAIMED IS

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1. A semiconductor triode, comprising:  
a semiconductor layer including a channel  
layer;

a first ohmic electrode supplying carriers  
10 into said channel layer;  
a second ohmic electrode collecting carriers  
from said channel layer; and

a gate electrode controlling a flow of said  
carriers through said channel layer from said first  
15 ohmic electrode to said second ohmic electrode,

said gate electrode including an insulating  
metal oxide film formed at an interface to a surface  
of said semiconductor layer.

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2. A semiconductor triode as claimed in  
claim 1, wherein said metal oxide film is an oxide of  
25 a metal element selected from the group consisting of  
Ti, Co, Ni, Ta, Pr, Hf, Zr and Pd.

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3. A semiconductor triode as claimed in  
claim 1, wherein said insulating metal oxide has a  
stoichiometric composition.

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4. A semiconductor triode as claimed in claim 1, wherein said insulating metal oxide film has a non-stoichiometric composition.

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5. A semiconductor triode as claimed in claim 1, wherein said insulating metal oxide film is provided further at an interface between said first ohmic electrode and said semiconductor layer and between said second ohmic electrode and said semiconductor layer.

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6. A semiconductor triode as claimed in claim 5, wherein said insulating metal oxide film has a thickness allowing tunneling of carriers.

7. A semiconductor triode as claimed in claim 1 wherein said metal oxide film is provided so as to cover a surface of said semiconductor layer continuously from said first ohmic electrode to said gate electrode and from said gate electrode to said second ohmic electrode.

8. A semiconductor triode as claimed in claim 1, wherein said channel layer includes a two-dimensional electron gas.

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9. A semiconductor triode as claimed in claim 1, wherein said channel layer comprises a doped semiconductor layer.

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